

AMENDMENT TO THE CLAIMS

1.(Currently Amended) A light emitting apparatus comprising a light emitting element, and a phosphor which absorbs a part of light emitted from said light emitting element and converts it into light with different wavelength, wherein

the surface of said phosphor is coated with a coating member which is made of a material different from the phosphor, wherein

said coating member is made of ~~any of metal oxide, metal nitride and or~~ metal oxynitride.

2.(Original) The light emitting apparatus according to claim 1, wherein said coating member coats the surface of said phosphor whereby having a substantially smooth film.

3.(Original) The light emitting apparatus according to claim 1, wherein said coating member is formed such that a large number of fine particles relatively smaller than said phosphor aggregate to coat the whole surface of said phosphor.

4.(Currently Amended) The light emitting apparatus according to ~~any of claims 1 to 3,~~ claim 1, wherein said coating member contains at least one metallic element selected from the group consisting of Al, Si, and In, Ga and the other rare earth elements.

5.(Currently Amended) The light emitting apparatus according to claim 1 to 4, wherein the phosphor before coating has hydration characteristics.

6.(Currently Amended) The light emitting apparatus according to claim 1 to 5, wherein said phosphor is an alkaline-earth silicon nitride phosphor.

7.(Currently Amended) The light emitting apparatus according to claim 1 to 5, wherein said phosphor is an alkaline-earth silicon oxynitride phosphor.

8.(Currently Amended) The light emitting apparatus according to claim 1 to 7, wherein the BET value of said coated phosphor is 1.0 to 10 times the BET value before coating.

9.(Currently Amended) The light emitting apparatus according to ~~any of claims 1 to 8,~~ claim 1, wherein the average thickness of said coating is 10 nm to 500 nm.

10.(Currently Amended) The light emitting apparatus according to ~~any of claims 1 to 13,~~ claim 1, wherein said coating is formed in chemical vapor deposition.

11.(Currently Amended) A phosphor for a light emitting element which absorbs a part of light emitted from the light emitting element and converts it into light with different wavelength, wherein

the surface of said phosphor is coated with a coating member which is made of a

material different from the phosphor, wherein

said coating member is made of ~~any of metal oxide, metal nitride and or~~ metal oxynitride.

12.(Original) The phosphor for a light emitting element according to claim 11, wherein said coating member coats the surface of said phosphor whereby having a substantially smooth film.

13.(Original) The phosphor for a light emitting element according to claim 11, wherein said coating member is formed such that a large number of fine particles relatively smaller than the phosphor aggregate to coat the whole surface of said phosphor.

14.(Currently Amended) The phosphor for a light emitting element according to ~~any of claims 11 to 13,~~ claim 11, wherein said coating member contains at least one metallic element selected from the group consisting of Al, Si, and In, Ga and ~~the other rare earth elements.~~

15.(Currently Amended) The phosphor for a light emitting element according to claim 11 ~~to 14,~~ wherein the phosphor before coating has hydration characteristics.

16.(Currently Amended) The phosphor for a light emitting element according to claim 11 ~~to 15,~~ wherein said phosphor is an alkaline-earth silicon nitride phosphor.

17.(Currently Amended) The phosphor for a light emitting element according to claim 11 to 16, wherein said phosphor is an alkaline-earth silicon oxynitride phosphor.

18.(Currently Amended) The phosphor for a light emitting element according to claim 11 to 17, wherein the BET value of said coated phosphor is 1.0 to 10 times the BET value before coating.

19.(Currently Amended) The phosphor for a light emitting element according to claim 11 to 18, wherein the average thickness of said coating is 10 nm to 500 nm.

20.(Currently Amended) The phosphor for a light emitting element according to claim 11 to 19, wherein said phosphor is charged to a negative surface potential before coating.

21.(Currently Amended) The phosphor for a light emitting element according to claim 11 to 20, wherein said coating is formed in chemical vapor deposition.

22. (Cancelled)

23.(Original) A method for producing a phosphor for a light emitting element which absorbs a part of light emitted from the light emitting element and converts it into light with different wavelength, the method comprises steps of:

absorbing a reaction precursor onto the surface of the phosphor; and
coating the surface of the phosphor with a metal nitride by reacting said reaction precursor with a coreaction material in chemical vapor deposition.

24.(Currently Amended) The method for producing a phosphor for a light emitting element according to claim ~~22 or~~ 23, wherein said reaction precursor is an organic metal.

25.(Currently Amended) The method for producing a phosphor for a light emitting element according to claim 24, wherein said organic metal contains at least one metallic element selected from the group consisting of Al, Si, and In, Ga and ~~the other~~ rare earth elements.

26.(Currently Amended) The method for producing a phosphor for a light emitting element according to ~~any of claims 22 to 25~~ claim 23, wherein said coreaction material is any of oxygen, water vapor and ammonia.

27. (Currently Amended) The method for producing a phosphor for a light emitting element according to ~~claim 22 to 26~~ 23, wherein the method further comprises a steps of thermally treating the phosphor for a light emitting element after coating in a non-oxidation atmosphere.

28.(Currently Amended) The method for producing a phosphor for a light emitting element according to claim 27, wherein the temperature range of said thermal treatment is ~~150~~ 150°C to 1000°C, and the time is 3 to 10 hours.

29.(Currently Amended) A nitride group phosphor which converts at least a part of light with first emission spectrum into light with at least one second emission spectrum in the range different from said first emission spectrum, comprising:

a nitride group phosphor material containing N (where N is nitrogen); and

a coating material which is made of any of metal oxide, metal nitride and metal oxynitride and coats coating-said nitride group phosphor material such that the BET value of the coated phosphor is 1.0 to 10 times the BET value before coating.

30.(Original) The nitride group phosphor according to claim 29, wherein said coating material is a metal nitride group material, or a metal oxynitride group material.

31.(Original) The nitride group phosphor according to claim 29, wherein said coating material forms a micro capsule.

32.(Currently Amended) The nitride group phosphor according to claim 29~~to 31~~, wherein said coating material has a multi-layer structure formed of a plurality of different materials.

33.(Original) The nitride group phosphor according to claim 32, wherein said coating material of the multi-layer structure has a high refractive index on said phosphor side, and a low refractive index on the surface side.

34.(Currently Amended) The nitride group phosphor according to claim 29 to 33, wherein said phosphor is a nitride group phosphor represented by $L-M-N:R$ or $L-M-O-N:R$ (where L contains at least one element selected from the group consisting of Be, Mg, Ca, Sr, Ba, and Zn, M contains at least one element selected from the group consisting of C, Si, Ge, Sn, Ti, Zr, and Hf, N is nitrogen, O is oxygen, and R is a rare earth element).

35.(Currently Amended) The nitride group phosphor according to claim 29 to 34, wherein said phosphor is represented by $L_xM_yN_{\{(2/3)x+(4/3)y\}}:R$, or $L_xM_yO_zN_{\{(2/3)x+(4/3)y-(2/3)z\}}:R$ (where L contains at least one element selected from the group consisting of Be, Mg, Ca, Sr, Ba, and Zn, M contains at least one element selected from the group consisting of C, Si, Ge, Sn, Ti, Zr, and Hf, N is nitrogen, O is oxygen, and R is a rare earth element), and has a crystal structure.

36.(Currently Amended) The nitride group phosphor according to claim 29 to 35, wherein said phosphor is represented by $L_xM_yN_{\{(2/3)x+(4/3)y\}}:R$, or $L_xM_yO_zN_{\{(2/3)x+(4/3)y-(2/3)z\}}:R$ (where $0.5 \leq x \leq 3$, $1.5 \leq y \leq 8$, $0 \leq z \leq 3$; L contains at least one element selected from the group consisting of Be, Mg, Ca, Sr, Ba, and Zn, M contains at least one element selected from the group consisting of C, Si, Ge, Sn, Ti, Zr, and Hf, N is nitrogen, O is oxygen, and R is a rare earth element), and has a crystal structure.

37.(Currently Amended) The nitride group phosphor according to claim 29~~to 36~~, wherein said phosphor is represented by $L_xM_yN_{\{(2/3)x+(4/3)y\}}:R$, or $L_xM_yO_zN_{\{(2/3)x+(4/3)y-(2/3)z\}}:R$ (where $x = 2, 4.5 \leq y \leq 6.0, 0.01 < z < 1.5; x = 1, 6.5 \leq y \leq 7.5, 0.01 < z < 1.5; \text{ or } x = 1, 1.5 \leq y \leq 2.5, 1.5 \leq z \leq 2.5$; L contains at least one element selected from the group consisting of Be, Mg, Ca, Sr, Ba, and Zn, M contains at least one element selected from the group consisting of C, Si, Ge, Sn, Ti, Zr, and Hf, N is nitrogen, O is oxygen, and R is a rare earth element), and has a crystal structure.

38.(Currently Amended) The nitride group phosphor according to claim 29~~to 37~~, wherein said phosphor is represented by $\text{Ca}_2\text{Si}_5\text{O}_{0.1}\text{N}_{7.9}:\text{Eu}$, $\text{Sr}_2\text{Si}_5\text{O}_{0.1}\text{N}_{7.9}:\text{Eu}$, $(\text{Sr}_{0.5}\text{Ca}_{0.5})_2\text{Sr}_5\text{O}_{0.1}\text{N}_{7.9}:\text{Eu}$, $\text{SrSi}_2\text{O}_2\text{N}_2:\text{Eu}$, or $\text{CaSi}_2\text{O}_2\text{N}_2:\text{Eu}$, and has a crystal structure.

39.(Currently Amended) The nitride group phosphor according to claim 35~~to 38~~, wherein the crystal structure of said phosphor is a monoclinic system or orthorhombic system.

40.(Currently Amended) The nitride group phosphor according to claim 29~~to 39~~, wherein said phosphor contains a B element.

41.(Currently Amended) A light emitting apparatus comprising a phosphor member composed of a transparent material containing a nitride group phosphor according to claim 29~~to 40~~, and a light emitting element, wherein said phosphor member absorbs a part of light emitted from said light emitting element and emits light with different wavelength.

42. (New) A nitride group phosphor which converts at least a part of light with first emission spectrum into light with at least one second emission spectrum in the range different from said first emission spectrum, comprising:

a nitride group phosphor material which includes an N element and is charged to a negative surface potential before coating of the phosphor; and

a coating material which is made of any of metal oxide, metal nitride and metal oxynitride and coats said nitride group phosphor material.

43. (New) The nitride group phosphor according to claim 42, wherein said coating material is a metal nitride group material, or a metal oxynitride group material.

44. (New) The nitride group phosphor according to claim 42, wherein said coating material forms a micro capsule.

45. (New) The nitride group phosphor according to claim 42, wherein said coating material has a multi-layer structure formed of a plurality of different materials.

46. (New) The nitride group phosphor according to claim 45, wherein said coating material of the multi-layer structure has a high refractive index on said phosphor side, and a low refractive index on the surface side.

47. (New) The nitride group phosphor according to claim 42, wherein said phosphor is a nitride group phosphor represented by $L-M-N:R$ or $L-M-O-N:R$ (where L contains at least one element selected from the group consisting of Be, Mg, Ca, Sr, Ba, and Zn, M contains at least one element selected from the group consisting of C, Si, Ge, Sn, Ti, Zr, and Hf, N is nitrogen, O is oxygen, and R is a rare earth element).

48. (New) The nitride group phosphor according to claim 42, wherein said phosphor is represented by $L_xM_yN_{\{(2/3)x+(4/3)y\}}:R$, or $L_xM_yO_zN_{\{(2/3)x+(4/3)y-(2/3)z\}}:R$ (where L contains at least one element selected from the group consisting of Be, Mg, Ca, Sr, Ba, and Zn, M contains at least one element selected from the group consisting of C, Si, Ge, Sn, Ti, Zr, and Hf, N is nitrogen, O is oxygen, and R is a rare earth element), and has a crystal structure.

49. (New) The nitride group phosphor according to claim 42, wherein said phosphor is represented by $L_xM_yN_{\{(2/3)x+(4/3)y\}}:R$, or $L_xM_yO_zN_{\{(2/3)x+(4/3)y-(2/3)z\}}:R$ (where $0.5 \leq x \leq 3$, $1.5 \leq y \leq 8$, $0 \leq z \leq 3$; L contains at least one element selected from the group consisting of Be, Mg, Ca, Sr, Ba, and Zn, M contains at least one element selected from the group consisting of C, Si, Ge, Sn, Ti, Zr, and Hf, N is nitrogen, O is oxygen, and R is a rare earth element), and has a crystal structure.

50. (New) The nitride group phosphor according to claim 42, wherein said phosphor is represented by $L_xM_yN_{\{(2/3)x+(4/3)y\}}:R$, or $L_xM_yO_zN_{\{(2/3)x+(4/3)y-(2/3)z\}}:R$ (where $x = 2$, $4.5 \leq y \leq 6.0$, $0.01 < z < 1.5$; $x = 1$, $6.5 \leq y \leq 7.5$, $0.01 < z < 1.5$; or $x = 1$, $1.5 \leq y \leq 2.5$, $1.5 \leq z \leq 2.5$; L

contains at least one element selected from the group consisting of Be, Mg, Ca, Sr, Ba, and Zn, M contains at least one element selected from the group consisting of C, Si, Ge, Sn, Ti, Zr, and Hf, N is nitrogen, O is oxygen, and R is a rare earth element), and has a crystal structure.

51. (New) The nitride group phosphor according to claim 42, wherein said phosphor is represented by $\text{Ca}_2\text{Si}_5\text{O}_{0.1}\text{N}_{7.9}:\text{Eu}$, $\text{Sr}_2\text{Si}_5\text{O}_{0.1}\text{N}_{7.9}:\text{Eu}$, $(\text{Sr}_{0.5}\text{Ca}_{0.5})_2\text{Sr}_5\text{O}_{0.1}\text{N}_{7.9}:\text{Eu}$, $\text{SrSi}_2\text{O}_2\text{N}_2:\text{Eu}$, or $\text{CaSi}_2\text{O}_2\text{N}_2:\text{Eu}$, and has a crystal structure.

52. (New) The nitride group phosphor according to claim 48, wherein the crystal structure of said phosphor is a monoclinic system or orthorhombic system.

53. (New) The nitride group phosphor according to claim 42, wherein said phosphor contains a B element.

54. (New) A light emitting apparatus comprising a phosphor member composed of a transparent material containing a nitride group phosphor according to claim 42, and a light emitting element, wherein said phosphor member absorbs a part of light emitted from said light emitting element and emits light with different wavelength.